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Eight hundred and seventy-four volumes and parts of periodicals were used on the premises by the scientific staff, and 105 volumes were borrowed. No record was kept of books used in the reading room.

The cooperation of Miss H. N. Wardle in the library is thankfully acknowledged.

EDWARD J. NOLAN, *Librarian*.

REPORT OF THE CURATORS.

The impossibility of obtaining metal cases and the greatly increased cost of everything connected with museum exhibits have seriously handicapped the Curators in any effort toward the installment of new exhibits during the past year as well as in the better arrangement of the study collections.

It has nevertheless been possible to keep the collections and the buildings in excellent condition, to properly care for all accessions and to make some notable improvements in the quarters of several of the departments.

The removal of the offices of the State Department of Health to Harrisburg on July 1st, last, and the consequent vacating of the rooms which they had occupied for many years made these quarters in the east of the north wing available for museum purposes and the botanical department was immediately installed there. The increased light in these rooms makes them much better suited for the work of the botanical staff and greatly facilitates the consultation of the herbarium. One of the old rooms at the west end of the north wing has been retained as a botanical storage room where collections can be roughly sorted and prepared for mounting.

The other rooms at the west end of the north wing were allotted to the mineralogical and geological department which in turn vacated the room on the fourth floor of the south wing which it had temporarily occupied, and which now reverts to the department of marine invertebrates. A dark room was erected in the new mineralogical quarters and running water was supplied in the herbarium.

The alterations to the heating plant outlined in last years report were completed during the summer and a telephone exchange established on the fourth floor of the middle wing in charge of a stenographer, where the clerical work of the curators can be carried on.

The large plaster shades hung below the ceiling lights on the first floor of the museum were removed as they had proved unsatisfactory and were in danger of falling.

The Indian elephant "Bolivar," which had never been a suitable specimen for mounting, deteriorated to such an extent that it was removed and dismounted during the autumn.

Five storage cases for mollusks and five for birds' nests and eggs, with the necessary trays were secured with the balance of the State appropriation of 1917. The latter have been arranged in the hallway on the fourth floor forming a small room in which the entire oological collection will be arranged.

Special educational exhibits were installed during the spring. One, consisting of mounted wild flowers from the herbarium, was displayed inside the large cases containing the forestry exhibit and was added to from time to time as the season advanced, so that it illustrated at any time the wild flowers to be found in bloom in the vicinity of Philadelphia.

The other consisted of bird skins from the study collection, the winter species being installed first and the others on approximately the date at which they arrive from the South so that the series at all times showed the wild birds to be found about the City. These collections were an innovation and attracted much attention among students of local natural history and the classes of school children which visited the museum in large numbers.

While most of the time of the museum staff was fully occupied in the care of the collections, it was also possible to do considerable field work.

Dr. Stone was granted leave of absence for three months, May 15, to August 15, and visited the Chiricahua Mountains, southern Arizona, the expenses being largely born by the Redfield botanical fund. He obtained a large collection of plants from a region not heretofore represented in the Academy's herbarium, as well as several thousand insects, and many birds, mammals and reptiles. The success of this expedition was largely due to the generosity of Mr. J. Eugene Law of California, who had invited Dr. Stone to be his guest at his camp in the Chiricahuas and did everything in his power to further the interests of the Academy. In the same connection the Academy is under obligations to Mr. Frank H. Hands of Pinery Canyon in the same mountains.

Mr. Morgan Hebard conducted another expedition to the southwestern United States during July, August and September primarily for the collection of Orthoptera visiting such localities as the Death Valley, Mts. Whitney, San Geronio and Charleston. As on previous

trips he generously took Mr. Rehn of the Academy staff with him and shared his collections with the institution.

Local trips were taken by other members of the staff which resulted in the acquirement of much valuable material while collections belonging to other institutions or individuals were identified by our specialists in return for a series of the duplicates.

The details of work in the several departments of the museum follow:

MAMMALS.

As in previous years many valuable specimens were received from the Zoological Society of Philadelphia which have been prepared as skins, or skeletons. The taxidermist Mr. McCadden has been constantly engaged upon the preparation of such material and in the cleaning of skeletons obtained in previous years. A large number of such osteological material has thus been added to the study series, and an African Wart Hog and Kinhajou have been mounted during the year.

Specimens were loaned to E. W. Nelson.

BIRDS.

A number of valuable local nests and sets of eggs were added to the Delaware Valley Ornithological Club Collection, while to the study collection of skins the most notable accessions were a large series of Colombian birds obtained by purchase from M. A. Carriker; a number of skins from French Guiana and Senegambia presented by the Philadelphia Museums, a collection of local birds, mainly mounted, from Mr. E. W. Woolman and some 200 specimens from Arizona collected by Dr. Stone.

Considerable rearrangement of the study collection was accomplished during the year and much miscellaneous material mounted and unmounted made readily available.

Many specimens received from the Zoological Society were prepared either as skins or osteological specimens which were catalogued and added to the series.

Many ornithologists have studied the collections during the year and specimens were loaned to H. C. Oberholser, and C. B. Cory.

REPTILES AND FISHES.

Mr. Henry W. Fowler who has continued in charge of this department reports that a large number of specimens have been received during the year, notable among which have been 30 specimens of

lizards from the Congo region presented by the American Museum of Natural History, a series of reptiles from the Death Valley and other localities in the western United States, collected by Messrs. Hebard and Rehn and 75 specimens of reptiles obtained in Arizona by Dr. Stone. A number of fishes from Pennsylvania and New Jersey were obtained by Mr. Fowler and other local collectors.

During the past year Mr. Fowler has catalogued, determined and labelled 738 specimens of fishes and has published three papers in the Academy's PROCEEDINGS involving the study and identification of many specimens in the collection.

He has also received for study from the U. S. National Museum the fishes obtained by the U. S. Exploring Expedition of 1839 to 1842, upon which he is preparing a report and of which the Academy will receive a duplicate series.

The collections have been consulted by several visiting specialists and material loaned to Alexander Ruthven and Thomas Barbour.

MOLLUSKS.

Dr. Henry A. Pilsbry in charge of the department of Mollusks reports that specimens were received during the year from 72 donors, among the more valuable gifts being 646 lots of North American fresh-water shells from Bryant Walker, selected by Dr. Pilsbry, and a series of Arizona shells and alcoholic specimens collected and presented by James H. Ferriss and A. A. Hinkley. Dr. V. Sterki supplied paratypes of numerous species of Sphaeriidæ and Mr. A. A. Hinkley a series of shells from Guatemala including types of new species. Mr. C. T. Simpson presented a large series of the handsome tree snails of Florida from newly explored localities in the Everglades and elsewhere; and substantial additions to the Pennsylvania and New Jersey collections have been made by E. G. Vanatta and Bayard Long.

Studies on the family Pupillidæ have been continued during the year and published in volume XXV of the MANUAL OF CONCHOLOGY which has been completed, the last part being now in press, Dr. C. Montague Cooke having collaborated in the description of the Hawaiian species. Work has also been done on a report on the mollusca of New York and many specimens have been determined for correspondents.

Mr. E. G. Vanatta has continued the arrangement of the collections, the preparation of material for the museum, and has published four short articles on new material received. Miss Ziegler has made good progress in cataloguing the tertiary fossils.

Specimens have been loaned for study to Dr. Paul Bartsch, Mr. J. B. Henderson and Dr. V. Sterki.

INSECTS.

Dr. Henry Skinner, head of the Entomological department, reports that as usual a large amount of material has been incorporated in the collections during the year but lack of cases has seriously retarded its arrangement. He has, however, completed the rearrangement of the large group of the exotic Hesperidæ.

Notable additions to the collection have been 75 diptera from the western United States and Alaska from F. M. Jones; some rare East Indian and South American lepidoptera from W. J. Coxe; 356 lepidoptera from Panama and Costa Rica, from D. E. Harrower; a gynandromorphic *Papilio turnus* from G. F. Pettinos, Jr.; a collection from the Chiricahua Mountains, Arizona, from Dr. W. Stone, consisting of about 4000 specimens; a large series of orthoptera and many coleoptera etc., from Morgan Hebard.

Mr. E. T. Cresson, Jr., has prepared a revision of the dipterous family, Sciomyzidæ, which is now in press, while the family Anthomyidæ has been studied by J. R. Malloch. Many new species of diptera have been received in return for identification of material sent by other institutions.

In orthoptera, Mr. J. A. G. Rehn has rearranged several groups so as to admit of the incorporation of newly received or determined material and has mounted and labelled many specimens. His studies during the year have covered the West Indian Blattidæ, African Blattidæ and a revision of the North American Trimerotropi.

Mr. Morgan Hebard, who has continued his researches at the Academy during the year, has completed a study of the Colombian dermaptera and orthoptera and also a monograph of the Blattidæ of Panama, and a report on Mantidæ from Malaysia, Papua and Australia.

Numerous entomologists have studied the collections and specimens were borrowed for study by Chas. Schaeffer and Edw. C. Van Dyke.

PLANTS.

The transfer of the herbarium to new quarters at the east end of the north wing, has already been mentioned. Mr. Stewardson Brown, in charge of this department, reports that the general series of plants has been arranged in the three lower rooms, the local collection in the middle room on the upper floor and the cryptogams in the south

room, the deSchweinitz and other historic collections being arranged in a fireproof vault which had been erected there. The north room has been fitted up for the mounting and preparation of specimens.

During the year, Miss Ada Allen, who has continued as an aid in the department, has mounted upwards of 3700 sheets of specimens comprising the remainder of the Joel Carter herbarium exclusive of the local material, 302 specimens from California, and 613 sheets of New England plants both of which were received by purchase. Most of these have been catalogued by Mr. Brown and distributed. Much additional time was spent in the general arrangement of the herbarium in its new quarters.

Mr. Bayard Long has spent much time in the critical study of various groups in the local herbarium and in its general supervision.

Much use has been made of the herbarium by visiting botanists and specimens have been loaned to C. A. Wetherby, M. L. Fernald, W. B. Maxon, C. Schneider, A. L. Grant and F. L. Stevens.

MINERALS AND ROCKS.

The change of location in this department to rooms adjacent to the exhibition collections of minerals has been very advantageous as it brings all of the mineralogical and geological material into close association where it is readily available for consultation.

The collection of Pennsylvania minerals has been transferred to the gallery of the mineral hall formerly occupied by the State Department of Health exhibit, where there is abundant room for its expansion.

The Curators are again indebted to Mr. Frank J. Keeley, curator of the William S. Vaux Collections, and to Mr. Samuel G. Gordon, a student of the Jessup Fund, for all the attention that has been given to this department. Mr. Gordon has cared for the various accessions and has completed an examination of the old collections and duplicates stored in the building, preparing the latter for gift or exchange to other institutions. He has also made a number of field trips to various counties in Pennsylvania and obtained many specimens of great value to the State collection.

ARCHEOLOGY.

Miss H. N. Wardle, who has cared for the collections in this department, reports that considerable shifting of exhibits has been necessary to make room for accessions or the display of material not hitherto on exhibition, many specimens from the A. H. Gottschall collection of North American Indian material having been thus displayed.

She attended to the packing, transfer and exhibit of a large and very valuable series of shell heap material collected by Mr. Clarence B. Moore on his early explorations in Florida, which was originally presented to the Wagner Free Institute of Science, but which through a generous donation, the Academy was enabled to secure for arrangement with the rest of the Clarence B. Moore collection.

Owing to the coal regulations and other hindrances, Mr. Moore's usual autumn expedition in the southern states was prevented, while his spring exploration in Florida was not very productive, owing to the country visited having been so thoroughly covered by his previous investigations.

WITMER STONE, *Chairman.*

REPORT OF THE CURATOR OF THE WILLIAM S. VAUX COLLECTIONS,
DECEMBER 1, 1919.

During the past year, the offices of the William S. Vaux Collections have been removed to the northwest corner of the building, where, with ample space, it is hoped to develop an adequate mineralogical laboratory.

All accessions to date, have been incorporated in the collection, after being catalogued and labelled by Mr. Samuel G. Gordon, who has presented the choice of the specimens, thirty-four in all, secured in connection with his collecting trips over the season, including an unrivalled suite of Nesquehonite and other interesting minerals from Pennsylvania localities.

Other gifts were received from the following donors:

Thomas Harvey. Almandite, Columbite, Tourmaline, Beryl, Corundum.—Delaware Co., Penna.

E. S. Moore. Calcite.—Montana.

Bently R. Morrison. Cacoxenite, Apophyllite, Byssolite.—Lancaster County and Chester County, Penna.

Frederick Pierce. Columbite and Monazite.—Boothwyn, Penna.

Washington A. Roebling. Epidismine.—Moore Station, N. J.

Frederick Oldach. Epidismine.—Robeson, Penna.

Twelve specimens were purchased, of which one of the most important was crystallized orpiment from Japan.

Respectfully submitted,

F. J. KEELEY, *Curator, Wm. S. Vaux Collections.*

REPORTS OF THE SECTIONS.

THE BIOLOGICAL AND MICROSCOPICAL SECTION.—The Biological and Microscopical Section held nine stated meetings during the year.